

REMARKS**I. Status of the Application**

Claims 13, 14 and 17 – 43 were pending in the application. Claims 21 – 33 have been withdrawn pursuant to a restriction requirement, and are canceled by the amendment presented above.

The Information Disclosure Statement filed on March 22, 2004 is objected to for failing to comply with 37 C.F.R. § 1.98(a)(3). The drawings are objected to because they appear to be informal. Claims 13, 14, 18, 31 and 39 are objected to for various informalities further discussed below.

Claims 13, 19 – 20 and 40 – 43 stand rejected on the grounds of non-statutory double patenting over claims 1 – 3 of U.S. Patent No. 6,423,802. Claims 34, 37 and 40-43 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Claims 13, 17-20 and 40-42 stand rejected under 35 U.S.C. § 102(b) over U.S. patent No. 4,536,297 to Loftin et al. (“Loftin”). Claims 13-14, 17-20 and 34-43 stand rejected under 35 U.S.C. § 103(a) over U.S. patent No. 5,620,947 to Elward-Berry and U.S. patent No. 5,080,809 to Stahl et al. (“Stahl”) in view of U.S. patent No. 5,008,025 to Hen. Claims 14 and 34-39 stand rejected under 35 U.S.C. § 103(a) over Loftin in view of U.S. patent No. 5,789,349 to Patel and Hen. Claims 13, 17-20 and 40-43 stand rejected under 35 U.S.C. § 103(a) over U.S. patent No. 6,124,244 to Murphey and U.S. patent No. 4,752,404 to Burns et al. (“Burns”).

Applicant has amended the claims in order to more clearly define and distinctly characterize Applicant’s novel invention. Claims 21-43 have been canceled. New claims 44-46 have been added. Support for claim 44 can be found in the specification and claims as originally filed, including, e.g., in the paragraph bridging from page 2 to page 3 of the specification, the first full paragraph on page 3 of the specification, page 5, lines 5-9 (aqueous polymer compositions comprising copolymer in 40% to fully saturated cesium formate solution), lines 23-24 (copolymer soluble in saturated cesium formate

solution), and the paragraph bridging from page 6 to page 7 of the specification,. Support for claim 45 can be found in the specification and claims as originally filed including, e.g., at page 4, lines 24-27, which discloses the composition of invention comprising cesium salt of a carboxylic acid with only trace or minor amounts of other salts. Support for claim 45 can be found in the specification and claims as originally filed including, e.g., at page 6 lines 4-8, which discloses the composition of invention comprising the recited percentages of copolymer and alkali metal carboxylate.

Formerly independent claim 13 has been amended to depend from independent claim 44, and also amended to correspond with claim 44. Specifically, the term “alpha,beta-unsaturated carbonyl compound” has been deleted and replaced with “acrylic acid or salt thereof,” and the terms “acrylamide” and “vinylpyrrolidone” have been deleted. Support can be found in the specification and claims as originally filed including, e.g., at page 3, lines 4-10, which discloses a preferred copolymer as the polymerization reaction product of the recited reactants. The term “water soluble” and the redundant recitation of an alkali metal salt of a carboxylic acid have also been deleted. The term “bifunctional” has been hyphenated to “bi-functional” in order to clarify that “an at least bi-functional cross-linking agent” also includes tri-functional, tetra-functional, etc. cross-linking agents. Support can be found in the specification and claims as originally filed including, e.g., on page 8, lines 10-12 of the specification.

Formerly independent claim 17 has been amended to depend from independent claim 44, and to delete all subject matter but the alkali metal salt of at least one halide. Claim 18 has been amended to clarify that “the alkali metal salt of at least one halide” comprises one alkali metal-halide salt or a mixture of alkali metal-halide salts.

Claim 19 has been amended to recite the molecular weight of the copolymer. Support can be found in the specification and claims as originally filed including, e.g., at page 7, lines 13-14. The section of claim 19 that recites physical properties of the copolymer composition has been re-written to clarify that the composition comprising copolymer dissolved in an 80% cesium formate solution at a concentration of 2 pounds of

the copolymer per barrel, measured at 120°F, yields the recited properties. Support can be found in the specification and claims as originally filed including, e.g., at page 5, lines 5-9 (aqueous polymer compositions comprising copolymer in 40% to fully saturated cesium formate solution), lines 23-24 (copolymer soluble in saturated cesium formate solution), and page 7, lines 13-20 (copolymer dissolved in 80% or higher alkali metal formate yields recited physical properties). Claim 19 is directed to a composition comprising the recited copolymer which possesses the recited properties when (and if) dissolved in an 80% cesium formate solution. The claimed composition is not limited to this specific formulation, nor does the claim require that the copolymer be dissolved in an 80% cesium formate solution. Claim 19 has also been amended to delete the term “water soluble.”

Applicant respectfully submits that the amendments presented herein add no new matter, and do not raise new issues requiring further search. Applicant respectfully requests entry and consideration of the foregoing amendments and reconsideration of the application in view of the following remarks, which are intended to place this case in condition for allowance.

II. Restriction Requirement

On page 2, paragraph 1 of the instant Office Action, a restriction requirement under 35 U.S.C. 121 was made. Applicant was required to elect one of the following groups of claims for examination:

- I. Claims 13, 14, 17-20 and 34-43
- II. Claims 21-23
- III. Claims 24-25
- IV. Claims 26-33

During a telephone interview with the Examiner, Applicant's representative made a provisional election with traverse of Group I, and now Applicant affirms the election of Group I, but with traverse because the subject matter of the four groups of claims is

sufficiently closely related to permit adequate ease of search and examination. New claims 44-46 are believed to be properly included in Group I.

III. Information Disclosure Statement

At page 4, paragraph 8 of the instant Office Action, the Information Disclosure Statement is held in non-compliance with 37 C.F.R. § 1.98(a)(3) because it does not include a concise explanation of the relevance of EP 0645429, which is published in the French language. Applicant is grateful to the Examiner for finding the related US Patent No. 5,484,843 and making it of record. Since the related US patent, which is published in English, has been cited and considered by the Examiner, a concise explanation of the relevance of EP 045429 is no longer necessary.

IV. Double Patenting Rejection

On page 5, paragraph 10 of the instant Office Action, claims 13, 19-20 and 40-43 are rejected on the grounds of non-statutory double patenting over claims 1 – 3 of U.S. Patent No. 6,423,802. Applicant respectfully traverses the rejection. Nevertheless, Applicant is providing herewith two terminal disclaimers, one for each of two assignees, enclosed with this response, to obviate the double patenting rejection.

V. Objection to the Drawings

On page 6, paragraph 11 of the instant Office Action, the drawings have been objected to because they appear to be informal. Applicant respectfully traverses the objection. Nevertheless, Applicant is providing, enclosed with this response, a replacement drawing sheet showing Fig. 1 and Fig. 2, both with white backgrounds, in order to overcome the objection.

VI. Objections to Claims 13, 14, 18, 31 and 39

On page 7, paragraphs 12-14 of the instant Office Action, claims 13, 14, 18, 31 and 39 are objected to for various informalities. Specifically, the Examiner objects to claims 13, 14 and 39 which recite “at least bifunctional cross-linking agent.” Applicant respectfully traverses the objections. Claim 39 has been canceled in the present amendment, so the objection to claim 39 is now moot. Claims 13 and 14 read “**an** at least bi-functional cross-linking agent” (claim 13 has been amended to hyphenate “bi-functional” to improve clarity). The claims require that the cross-linking agent be at least bi-functional, so that tri-functional, tetra-functional, etc. cross-linking agents are claimed as well. Support for this can be found on page 8, lines 10-12 of the specification. “[T]he cross-linking agent should be at least bifunctional, such as N,N’-methylenebis[2-propenamide].” Therefore, the claim language is formal and does not require correction.

Claim 18 has been amended to recite “wherein the alkali metal salt of at least one halide is selected from the sodium, potassium or cesium salts of chloride, the sodium, potassium or cesium salts of bromide, and mixtures of said salts.” The amended claim clarifies that “the alkali metal salt of at least one halide” comprises one alkali metal-halide salt, or a mixture of alkali metal-halide salts.

Claim 31 has been canceled, so no correction is necessary. Accordingly, Applicant respectfully requests withdrawal of the objections and allowance of claims 13, 14 and 18.

VII. 35 U.S.C. § 112, Second Paragraph, Rejections of Claims 34, 37 and 40-43

On page 8, paragraphs 16-17 of the instant Office Action, claims 34, 37 and 40-43 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses the rejection. Nevertheless, claims 34, 37 and 40-43 have been canceled in the present amendment, rendering the rejection moot.

VIII. Claims 13 and 17-20 Are Novel over Loftin

On page 9, paragraph 19 of the instant Office Action, claims 13, 17-20 and 40-42 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Loftin, incorporating U.S. Patent No. 4,309,523 to Engelhardt et al. ("Engelhardt"). The Examiner asserts that Loftin and Engelhardt disclose each and every limitation of the claims. Applicant respectfully traverses the rejection.

New independent claim 44 is directed to a composition comprising copolymer having functionality including at least sulfonate groups and carboxylate groups. Neither Loftin nor Engelhardt teaches or suggests a copolymer which possesses carboxylate functionality. Therefore, Loftin and Engelhardt fail to anticipate claim 44. For the same reason, Loftin and Engelhardt also fail to anticipate claims 13, 17, 18 and 20, which have been amended to depend directly or indirectly from claim 44. Claim 13 has been amended to recite that the copolymer is formed as the polymerization reaction product of acrylamidomethylpropanesulfonic acid or salt thereof and acrylic acid or salt thereof, which is not taught or suggested by Loftin or Engelhardt. Amended independent claim 19 is directed to a composition comprising copolymer formed as the polymerization reaction product of acrylamidomethylpropanesulfonic acid or salt thereof and alpha,beta-unsaturated carbonyl compound, which Loftin and Engelhardt fail to anticipate. Claims 40-42 have been canceled in the present amendment, thereby rendering moot their rejection.

For the aforementioned reasons, Loftin and Engelhardt do not teach or suggest each and every limitation of claims 13 and 17-20. Accordingly, Applicant respectfully requests withdrawal of the rejection and allowance of claims 13 and 17-20 and claims 44-46.

IX. Claims 13, 14 and 17-20 Are Not Obvious over Elward-Berry and Stahl as further evidenced by Hen

On page 12, paragraph 21 of the instant Office Action, claims 13, 14, 17-20 and 34-43 stand rejected under 35 U.S.C. § 103(a) over Elward-Berry and Stahl as further evidenced by Hen. Applicant respectfully traverses the rejection. Claims 34-43 have been canceled in the present amendment, thus rendering moot the rejection against them.

The requirements of a *prima facie* case of obviousness are not met for the subject rejection under 35 U.S.C. § 103(a). Each of claims 13, 14 and 17-20 is patentable over Elward-Berry because Elward-Berry fails to teach or suggest the specific combination recited in the claims. With regard to independent claim 44 and, therefore, claims 13, 17, 18 and 20, which have been amended to depend directly or indirectly from claim 44, Elward-Berry fails to teach or suggest a composition comprising copolymer having functionality including at least sulfonate groups and carboxylate groups, and alkali metal salt of a carboxylic acid, wherein the copolymer has a weight average molecular weight of 1,000,000 to 5,000,000; and when dissolved in an 80% cesium formate solution at a concentration of 2 pounds of the copolymer per barrel, measured at 120°F, yields an apparent viscosity of at least 20 cPs, a plastic viscosity of at least 15 cPs, and a yield point of at least 5 lb/100 ft².

Elward-Berry does not teach the use of the recited copolymer nor does it teach a copolymer having the recited molecular weight. Instead, Elward-Berry teaches the use of a different type of polymer. Specifically, it teaches the use of a polymer produced from at least two monomers selected from the group consisting of 2-acrylamido-2-methylpropanesulfonate, acrylamide, and 2-vinylpyrrolidone. (See e.g. col. 3, lines 56-59.) Elward-Berry gives Driscoll D as a preferred example of these different polymers. (See e.g. col. 6, lines 23-33, col. 7, lines 18-21, Examples 2-5.) In fact, the only mention in Elward-Berry of a copolymer such as recited in the present claims is in comparative Example 3, wherein the copolymer Therma-Chek is said to not work. Specifically,

Elward-Berry states: “These tests showed that Therma-Chek ... *would not work effectively* with fine sized-salt as a filtration control additive after high temperature aging. *Only* copolymers of the type represented by *Driscol D* work synergistically with fine sized salt to produce a temperature-stable perforation and workover fluid.” (Col. 10, lines 22-67; emphasis added.) Thus, Elward-Berry teaches away from the use of an AMPS/acrylic acid copolymer.

Further, there is no example in Elward-Berry that combines a copolymer having functionality including at least sulfonate groups and carboxylate groups with an alkali metal salt of a carboxylic acid, nor specifically cesium formate. Nor does Elward-Berry provide motivation for such a combination, in fact it teaches away from it. Thus, Elward-Berry fails to teach, suggest, or render obvious the subject matter of claim 44 or that of any of its dependent claims.

The same reasoning supports the patentability of claim 19 over Elward-Berry. That is, rather than the copolymer of claim 19 formed as the polymerization reaction product of acrylamidomethylpropanesulfonic acid or salt thereof and alpha,beta-unsaturated carbonyl compound, Elward-Berry teaches the use of a polymer produced from at least two monomers selected from the group consisting of 2-acrylamido-2-methylpropanesulfonate, acrylamide, and 2-vinylpyrrolidone.

Stahl and Hen fail to cure the deficiencies of Elward-Berry. The Examiner relies on Stahl and Hen to disclose details of the copolymer. But Hen fails to teach carboxylate functional groups as recited for the copolymer of independent claim 44. Elward-Berry refers to Stahl for a general description of how to produce polymers made from at least two monomers selected from the group consisting of AMPS, acrylamide, and 2-vinylpyrrolidone (col. 5, lines 14-20 of Elward-Berry). The Examiner asserts that other copolymers disclosed by Stahl, for example VP/Am/Na-AMPS/AA copolymer having a 30/5/55/10 weight ratio, are the same copolymers encompassed by the instant claims, and must inherently possess the same physical properties as claimed. However, Stahl does not disclose a copolymer soluble in 80% cesium formate solution, nor does Stahl disclose

a copolymer soluble in 80% cesium formate solution that yields physical properties as recited in claims 19 and 44. Please see the attached Declaration of inventor Edward Miller, which states that none of the copolymers disclosed by Stahl is substantially soluble in an 80% cesium formate solution. Because the copolymers of Stahl are not soluble in an 80% cesium formate solution, they cannot possess the recited physical properties *when dissolved* in 80% cesium formate solution.

Therefore, the combination of Elward-Berry, Stahl, and Hen fails to teach or suggest the subject matter of claim 19 or claim 44. There is also a lack of motivation to combine references. In fact, Elward-Berry teaches away from the claimed invention. Accordingly, claim 19 and claim 44 each is patentable over the combination of Elward-Berry, Stahl and Hen. Each of claims 13, 14, 17, 18 and 20 depends directly or indirectly from claim 44 and is patentable over Elward-Berry, Stahl, and Hen for at least the same reasons as for claim 44. As a *prima facie* case of obviousness cannot be made, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejection and allowance of claims 13, 14, 17-20 and 44-46.

X. Claims 14 and 34-39 are Not Obvious over Loftin in view of Patel as further evidenced by Hen

On page 15, paragraph 22 of the instant Office Action, claims 14 and 34-39 stand rejected under 35 U.S.C. § 103(a) over Loftin in view of Patel as further evidenced by Hen. Applicant respectfully traverses the rejection. Claims 34-39 have been canceled in the present amendment, thus rendering moot the rejection against them.

Claim 14 depends directly from amended claim 13, and indirectly from amended claim 44. Loftin fails to teach or suggest a copolymer formed as the polymerization reaction product of acrylic acid or salt thereof as a monomer, as recited in claim 13. As discussed in section VIII above, Loftin fails to teach or suggest a copolymer which possesses carboxylate functionality as recited in claim 44. Therefore, Loftin fails to teach each and every limitation of dependent claim 14.

Patel and Hen fail to remedy the deficiencies of Loftin. Hen fails to teach acrylic acid monomers or carboxylate functional groups in the copolymer. Patel does not teach or suggest a copolymer soluble in 80% cesium formate solution. Nor does Patel teach or suggest such a copolymer that yields physical properties as recited in claim 44 when (and if) dissolved in 80% cesium formate solution. Please see the attached Declaration of inventor Edward Miller, which states that none of the copolymers disclosed by Patel having functionality including at least sulfonate groups and carboxylate groups is substantially soluble in an 80% cesium formate solution. Because the copolymers of Patel are not soluble in an 80% cesium formate solution, they cannot possess the recited physical properties *when dissolved* in 80% cesium formate solution.

Even if all claim limitations were taught by Loftin and Patel, neither reference provides motivation to combine their respective teachings. Not only does Loftin not disclose forming the copolymer using methylenebis(2-propenamide), otherwise known as methylene bis acrylamide, as a cross-linking agent (as admitted by the Examiner), but Loftin in no way suggests that the disclosed linear terpolymer is unsatisfactory, nor does Loftin provide motivation to modify its disclosed terpolymer by adding the cross-linking agent of Patel, or any cross-linking agent at all. Neither does Patel provide motivation to combine its disclosed cross-linked copolymer with Loftin's clay-stabilizing organic acid salt, because Patel does not recognize the problem addressed by Loftin of borehole instability caused by sloughing of hydrated clay-containing materials that have been in contact with the drilling fluid. Thus, there is no suggestion to combine reference teachings.

Since a *prima facie* case of obviousness cannot be made, Applicant respectfully requests withdrawal of the rejection and allowance of claim 14.

XI. Claim 13, 17-20 and 40-43 are Not Obvious over Murphey and Burns

On page 17, paragraph 23 of the instant Office Action, claims 13, 17-20 and 40-43 stand rejected under 35 U.S.C. § 103(a) over Murphey and Burns. Applicant

respectfully traverses the rejection. Claims 40-43 have been canceled in the present amendment, thus rendering moot the rejection against them.

Each of claims 13 and 17-20 are patentable over Murphey because Murphey fails to teach or suggest the specific combination recited in the claims. With regard to independent claim 44, Murphey fails to teach or suggest a composition comprising copolymer having functionality including at least sulfonate groups and carboxylate groups, and alkali metal salt of a carboxylic acid, wherein the copolymer has a weight average molecular weight of 1,000,000 to 5,000,000; and when dissolved in an 80% cesium formate solution at a concentration of 2 pounds of the copolymer per barrel, measured at 120°F, yields an apparent viscosity of at least 20 cPs, a plastic viscosity of at least 15 cPs, and a yield point of at least 5 lb/100 ft².

The Examiner is of the opinion that Murphey discloses in Tables 2 and 4 the physical properties recited in claims 19. However, claim 19 and new independent claim 44 each recites physical properties yielded by the recited copolymer “when dissolved in an 80% cesium formate solution at a concentration of 2 pounds of the copolymer per barrel, measured at 120°F.” The physical properties disclosed by Murphey in Tables 2 and 4 are of compositions that do not include a copolymer having sulfonate groups and carboxylate groups, together with an alkali metal salt of a carboxylic acid. Furthermore, Murphey does not disclose copolymer molecular weight, nor does it disclose a copolymer soluble in 80% cesium formate solution, nor does it disclose a copolymer soluble in 80% cesium formate solution that yields physical properties as recited in claims 19 and 44. Please see the attached Declaration of inventor Edward Miller, which states that none of the copolymers disclosed by Murphey having functionality including at least sulfonate groups and carboxylate groups is substantially soluble in an 80% cesium formate solution. Because the copolymers of Murphey are not soluble in an 80% cesium formate solution, they cannot possess the recited physical properties *when dissolved* in 80% cesium formate solution.

Instead, Murphey recites “wish lists” of compounds. One list has numerous alternatives to acrylic acid as a monomer that may be included in a copolymer that has pendant amide and sulfonic acid or sulfonate groups (col. 3, line 62 to col. 4, line 14). Another list has numerous alternatives to alkali metal salts of carboxylic acids as soluble salts used in brine (col. 3, lines 34-41). The Examiner is improperly using hindsight to cherry-pick ingredients from the lists, because the two lists are recited without any suggestion or motivation to combine the compounds in the specific manner to arrive at the claimed composition. All the examples in Murphey teach the use of calcium bromide, zinc bromide, calcium chloride and/or sodium bromide, and no examples teach an alkali metal salt of a carboxylic acid. The copolymer in all the examples is an acrylamide/AMPS copolymer blend as taught by Burns. There is no example in Murphey that combines a copolymer having functionality including at least sulfonate groups and carboxylate groups with an alkali metal salt of a carboxylic acid, nor specifically cesium formate. Nor does Murphey provide any suggestion or motivation for such a combination. Thus, Murphey fails to teach, suggest, or render obvious the subject matter of claim 19 and Murphey fails to teach, suggest, or render obvious the subject matter of claim 44.

Burns fails to cure the deficiencies of Murphey. Contrary to the Examiner’s assertion, Burns does not teach a copolymer having various ratios of AMPS or salt thereof with acrylic acid. Nowhere does Burns mention acrylic acid as a possible monomer unit. Burns fails to teach or suggest a copolymer having functionality including at least sulfonate groups and carboxylate groups. Therefore, Murphey combined with Burns fails to teach each and every claim limitation. For the same reasons given above for Murphey, Burns fails to provide motivation to combine a specific copolymer with a specific salt from the wish list of Murphey to arrive at the specific composition claimed by Applicant. Thus, Murphey in view of Burns fails to teach, suggest, or render obvious the subject matter of claim 19, and Murphey in view of Burns

fails to teach, suggest, or render obvious the subject matter of claim 44. Accordingly, claim 19 and claim 44 each is patentable over the combination of Murphey and Burns.


Each of claims 13, 17, 18 and 20 depends directly or indirectly from claim 44 and is patentable over Murphey and Burns for at least the same reasons as for claim 44. As a *prima facie* case of obviousness cannot be made, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejection and allowance of claims 13 and 17-20.

XII. Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims submitted herewith are in condition for allowance, which action is earnestly requested.

Respectfully submitted,
William Benton and Edward Miller

27 July 2006
Date


Peter D. McDermott (Reg. No. 29,411)
Banner & Witcoff, Ltd.
28 State St. - 28th Floor
Boston, MA 02109
Phone: 617.720.9600
Fax: 617.720.9601